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ABSTRACT

A followup study was conducted to assess the impact of two 1984 Summer Scholars Programs at the University of Missouri, Kansas City, School of Medicine, which sponsors a combined bachelor's degree and doctor of medicine (M.D.) program. The university, in cooperation with area hospitals, implemented a 4-week program to identify and motivate promising minority and low-income high school students toward health sciences careers. Students had the opportunity to observe and visit various health practitioners; attended a class in histology; and participated in activities to introduce them to interviewing skills, test-taking skills, and study skills. In addition, students who had participated in the 1983 Summer Scholars Program attended an advanced program, which involved them in clinical rotations with health practitioners and skill development in the use of language and the computer. Questionnaires were completed from 18 graduating students who participated in the 1984 programs. Student responses included: 14 planned careers in medicine and four had been accepted by the medical school; all students returned to their high school and undertook strong academic programs; 43 percent of their coursework was in either science or mathematics; and the 18 students sent 52 applications to colleges and universities. (SW)

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1984 SUMMER SCHOLARS PARTICIPANTS:

A FOLLOW UP

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1984 SUMMER SCHOLARS PARTICIPANTS: A FOLLOW UP

In the summer of 1984, the UMKC School of Medicine, in cooperation with area hospitals, planned and developed a four week educational program to identify and motivate promising minority and low income Jackson County and Wyandotte County high school students towards careers in the health sciences.

Sixty-nine applications were received and 24 students were selected to participate. Of those students, 12 were seniors, 10 were juniors, and 2 were sophomores. The program consisted of one-half day blocks of time during which students had an opportunity to observe and visit with various health practitioners. In addition, students attended a class in histology and also had the opportunity to participate in activities that introduced them to interviewing skills, test taking skills, and study skills.

Concurrent with the 1984 Summer Scholars Program was the 1984 Advanced Summer Scholars Program. This educational activity was established to help further clarify career goals for six senior students and one junior student who had participated as juniors and sophomores in the 1983 Summer Scholars Program. Their mornings were spent in structured clinical rotations under the direction of senior physicians and other health practitioners. Their afternoons were committed to developing skills in the use of language and the computer.

In order to assess some of the impact of the two 1984 Summer Scholars Programs, the 18 students who had been seniors were mailed a questionnaire which sought information concerning their academic program during their senior year, and also their plans for higher education. Students were asked to identify their career interests, and also were asked to list the subjects that were taken during the first and second semesters of their senior year. They were also asked to identify any course work that may have been taken at a local college or university. In addition, students were asked to list the institutions of higher education to which they applied, and also to designate those institutions that had accepted them.

Since higher education has become very expensive, we were interested in the sources to which Summer Scholars students had applied for financial aid, and also the commitment for financial aid that they had received. We were also interested in identifying the intended major of the students, and the total grade point average and science grade point average they had amassed during their high school careers.

In addition, we asked the students to respond to the following question: "How did the Summer Scholars Program impact on you as it relates to your senior year in high school?"

The questionnaire was mailed to the 18 seniors who had participated in either the regular or the Advanced 1984 Summer Scholars Program. After two weeks, a second copy of the Summer Scholars follow-up questionnaire was mailed to those students who had not responded to the first mailing. The following week, a follow-up telephone call was made to those students who still had not returned their questionnaire. Of the 18 students from whom we sought information, all eventually returned their questionnaires.

List of Career Choices by Professions

Table 1 indicates that most of the students plan careers in medicine. Seventy-eight percent (14/18) selected medicine as their first choice, and two additional first choices were health-science-related. Of those 14, designating medicine, four were selected to attend the UMKC School of Medicine in the Fall of 1985. Among students who indicated a second career choice, the first not being medicine, three selected medicine, and two other second choices were science related.

TABLE 1
List of Career Choices by Profession

CAREER INTEREST	1st CHOICE	2nd CHOICE	3rd CHOICE
Biology		1	
Business	1	1	
Computer Science			1
Engineering	1		
Medicine*	14	3	
Missionary Work		1	
Nursing Home Management	1		
Occupational Therapy	1	1	
Pharmacy			2
Physical Therapy			1
Social Work			1
Teaching		1	

* Includes: Emergency Medicine, General Practice, Internal Medicine, Neonatology, Ophthalmology, Orthopedic Surgery, Sports Medicine, Surgery

Classes and Semester Credits Taken During the Senior Year

One of the single most effective steps that can be taken towards better representation of low income and minority group students in higher education lies in strong academic preparation at the senior high school level. Students preparing for careers in the health sciences must particularly have a strong background in the areas of science and mathematics or their probability of success will be diminished. These subjects deal with the fundamental concepts which form the building blocks for successful health science education program.

In a recent study entitled Blacks and the Health Professions in the 80's: A National Crisis and a Time For Action, the authors stated that:

In interviews with health professions students, a number indicated that poor counseling, particularly in high school, steered the students away from "hard" mathematics and science curricula to "soft" courses and, in many cases, to non-college preparation courses.

The data collected for this study indicate that the students who participated in the Summer Scholars Program then returned to their high schools and pursued rigorous academic programs. As illustrated in Table 2, Summer Scholars students obtained 43.4% of their credits in the areas of science/mathematics. Twenty-two percent (40/184) of their credits were in either biology, chemistry, or physics classes, and twenty-two percent (40/184) of their credits were in the area of mathematics. Seventeen percent (31/184) of the course work taken by the Summer Scholars students involved language development. The remaining percentage of the students' time was committed to areas such as the fine arts, foreign languages, and the social sciences.

As stated earlier, the data thus suggest that all of the senior Summer Scholar students returned to their high schools and undertook strong academic programs that would help prepare them for admission to health education careers or other programs in higher education.

In addition to the classwork at the high school level, five students enrolled in area institutions of higher education. Three of the students enrolled at UMKC to study courses in biology, english, mathematics, and physics, while another student enrolled at the Johnson County Community College to pursue her interest in mathematics. A fifth student received college credit from Rockhurst College in the areas of english and history.

TABLE 2

Classes and Credits Taken During Senior Year

Area of Study	Percent of Time *
ACCOUNTING - 3	1.6
AUTO SHOP - 2	1.1
BIOLOGICAL SCIENCE - 9	4.9
Advanced Biology - 5	
Anatomy - 1	
Physiology - 3	

TABLE 2 (Continued)

Area of Study	Percent of Time *
CHEMISTRY - 12	6.5
AP Chemistry - 5	
Chemistry - 7	
DRAFTING - 2	1.1
FINE ARTS/HUMANITIES - 16	8.7
Art - 2	
Band - 5	
Choir - 3	
Drawing - 2	
Humanities - 4	
FOREIGN LANGUAGE - 20	10.9
French - 13	
Latin - 1	
Spanish - 6	
HISTORY - 4	2.2
HOME ECONOMICS - 1	0.5
Independent Project - 1	
LANGUAGE SKILLS - 31	16.8
American Lexicon - 1	
College Composition - 8	
Contemporary Literature - 1	
English - 10	
Expository Writing - 3	
Film and Literature - 1	
Individual Reading - 3	
Literature of the South - 1	
Mass Media - 1	
Modern American Literature - 2	
MATHEMATICS/COMPUTER SCIENCE - 40	21.7
Advanced Math - 8	
Calculus - 4	
Computer Math - 2	
Enriched Math Topics - 2	
Introduction to Calculus - 5	
Math Analysis - 6	
Pre-Calculus - 5	
Pre-College Math - 1	
Programming - 6	
Trigonometry - 1	

TABLE 2 (Continued)

Area of Study	Percent of Time *
OFFICE AID - 1	0.5
OFFICE SKILLS - 4	2.2
Typing - 4	
PHILOSOPHY - 1	0.5
PHYSIOLOGY - 2	1.1
PHYSICAL EDUCATION - 3	1.6
PHYSICS - 19	10.3
POLITICAL SCIENCE - 4	2.2
American Government - 3	
Political Parties - 1	
PSYCHOLOGY - 3	1.6
RELIGION - 3	1.6
RESEARCH PAPER - 1	0.5
ROTC - 1	0.5
SOCIAL SCIENCE - 6	3.3
Issues - 2	
Sociology - 3	
World Culture - 1	
TEACHER'S AID - 6	3.3
TOTAL CLASSES TAKEN - 184	

* Does not total 100% due to rounding procedure.

Standardized Test Scores

Standardized tests are usually required for admission to institutions of higher education. Although there are seldom minimum scores one must achieve for entrance to a specific institution, it is important for a student to score as high as possible on these examinations. The Summer Scholars Program devotes two half-day sessions to instruction in how a student can best take standardized tests. Table 3 indicates the type of tests taken and the number of students who took each examination.

TABLE 3
Standardized Test Taking During Senior Year

Name of Test	# Taking Test	Scores
ACT	16	19, 27, 27, 23, 24, 25, 21, 29, 24, 25, 26, 24, 25, 27, 31, and not reported
SAT	9	420V-400M, 640V- 530M, 450V-520M, 450V-550M, 490V- 640M, 580V-650M, 950 Composite, 1140 Composite, and Not Reported

Applications to Institutions of Higher Education

Summer Scholars students applied to a number of institutions of higher education. As shown in Table 4, 52 applications were sent to 27 different colleges and universities throughout the country. Eight of the institutions are publicly supported and 19 are privately supported. Four of the institutions are within the state of Missouri. Of the 52 applications, 46 were accepted.

TABLE 4

Institutions of Higher Education to which Summer Scholars
Applied and to which They Were Accepted.

Institution	Number Applied	Number Accepted
Brown University	1	1*
Christ College	1	1
Concordia College	1	1
Cornell University	1	1
Creighton University	1	1
Drake University	2	2
Duke University	1	1
Georgetown University	1	1
Harvard University	1	0
Howard University	2	2
Iowa State University	1	1
Johns Hopkins	1	0
Kansas State University	2	2
Northwestern University	2	2
Notre Dame University	1	1
Oral Roberts	1	1
Rockhurst College	1	1
Trinity University	1	1
University of Colorado	1	1
University of Illinois	1	1
University of Kansas	8	6
University of Michigan	1	1
Univ. of Missouri (Columbia)	4	4
Univ. of Missouri (Kansas City)		
College of A & S	2	2
School of Medicine	7	4
Valparaiso University	1	1
Washington Univ. (St. Louis)	5	5
Westminister College	1	1
TOTALS	52	46

* Indicates wait listed

Institutions that Students Will Attend

Table 5 indicates the institutions of higher education that Summer Scholars participants will attend. Six of the students will attend UMKC, and 4 of the six will enroll in the UMKC School of Medicine. Three of the institutions are public and six are private. Nine of the students will continue their education in Missouri.

TABLE 5
Institutions that Students Will Attend

Institution	Number of Students
Concordia College (Nebraska)	1
Drake University	2
Howard University	1
Oral Roberts University	1
University of Colorado	1
University of Kansas	2
University of Missouri (Kansas City)	
Arts and Science	2
School of Medicine	4
Washington University (St. Louis)	2
Westminister College	1

Financial Aid

Many of the students in the Summer Scholars Program were from low income families. Rising tuitions and fees and the concomitant increased need for financial assistance are particularly acute problems for the minority and low income student. In order to enroll in institutions of higher education, significant amounts of financial aid are usually required. Thirteen of the respondents indicated that they had applied to a least two sources for financial aid and eight respondents indicated that they had applied to three or more sources for financial aid. Table 6 indicates some of the selected sources that students used as they sought financial assistance for their college education.

Eleven of the students indicated that they had received offers of financial aid of \$2,000 of greater, and seven of those students had received offers of \$5,000 or greater.

TABLE 6

Selected List of Sources for Financial Aid

Sources
1. Avon Scholarship Foundation
2. B'nai Brith Youth Award
3. Board of Curators Scholarship
4. Flarsheim Merit Scholarship
5. GSL
6. Kappa Alpha Psi
7. Kaw Valley Medical Society
8. Links
9. Missouri State Grants
10. MDAA
11. National Council of Jewish Women
12. National Honor Society
13. NDSL
14. Optimist
15. Pell Grant
16. Raytown PTA
17. UMKC Scholars Awards
18. Unico
19. Westlake Scholarships

High School Academic Achievement

As illustrated in Table 7, ten of the respondents were in the top 21 of their graduating class and seven were in the top 5 of their graduating class. Eleven students had a total Grade Point Average of 3.5 or higher.

TABLE 7

Seven Semester Grade Point Average, Science Grade Point Average, and Class Rank

Total GPA*	Class Rank*
3.25	51/251
3.57	31/328
3.6	4/83
3.83	4/164
9.7/11.0	19/332
3.67	34/365
10.45/11.00	5/332
3.79	2/21
3.5	21/270

TABLE 7 (Continued)

Total GPA*	Class Rank*
3.93	2/232
3.46	3/133
3.4	62/123
3.4	25/165
3.84	2/270
3.7	17/127
3.9	12/123
B	Students Not Ranked

* Denotes first seven semesters of high school

Program Impact

Students were asked to respond to the question, "How did the Summer Scholars Program impact on you as it relates to your senior year in high school?" Generally, the program appeared to have had a strong impact on students with regard to career confirmation or, at least, narrowing of choice, and enhancement of self confidence, and self esteem. Students acquired an insight into what health careers require, and feel that they can now make a more informed and better decision concerning their initial career choice. In addition, many students indicated that the interviewing skills, test taking skills, and study skills acquired during the program had been very helpful.

Illustrative excerpts from each of the responses were as follows:

- I feel that the Summer Scholars Program affected my senior year plans by making me realize that I needed to continue to take English and math related courses. I believe it was the strong emphasis put on the afternoon courses that made me stick with serious courses in school. Since this was my senior year and I only had two more credits to complete, I have to admit the thought of just kicking back did sound interesting, but I'm glad I stuck it out. I would like to thank everyone involved with the program for making me realize that I can play after I graduate from college but now is the time for serious study and concentration.

- The effect the Summer Scholars Program had on me during my senior year was to help me in my college decision. First of all it helped me to prepare for the ACT test. But more importantly it helped me to narrow my possible career choices so I'd know what to look for in a college. It also helped me refine my study skills and gave me a little insight into what to expect in college.

- The Summer Scholars Program greatly enhanced my knowledge in the biology areas. I was surprised to see how many things that I learned come up in my assignments in anatomy and physiology class. I would say last summer's experience made me very prepared for this year's studies. The histology course and medical terminology sessions proved to provide the greatest amount of

Program Impact (Continued)

learning in the shortest period of time. I recommend Summer Scholars to anyone who is interested in becoming a more knowledgeable and well-rounded student.

- The Summer Scholars Program helped me in many different ways my senior year in high school. Probably the most evident area was in the classes I choose. If my plans were to go on to study medicine I would have taken more health related classes and joined a health careers club. Because I felt that a health related field was not for me I didn't waste class space for subjects that would not interest me. Also it gave me a head start on choosing a profession that would be more suited to my interests.

In closing I would like to say thanks for letting me have the opportunity to participate in the Summer Scholars Program. It not only gave me a chance to see many different jobs that are involved in the running of a hospital, it gave me a greater sense of awareness on how valuable one's health is and how important it is to have capable professionals to see that it stay that way.

- The Summer Scholars Program helped solidify my decision to enter the medical field. The Program also reminded me of what I needed to do as far as academics are concerned. In fact, my GPA for my senior year is 4.0. The program also reminded me of the need to get involved in school activities. The Summer Scholars Program also takes a little "fear" out the future. It gives an idea of what is going to happen if you enter a medical-related field. This is the programs' most valuable asset. I thoroughly enjoyed the program and would recommend it to anyone who is thinking of medicine as a career.

- The Summer Scholars Program helped me to understand the importance of high school. Knowing that my senior year is the last step before college, I put my all into my senior year. Summer Scholars made my senior year easier because it helped me to decide what I wanted to do with my future and having that decision out of the way made planning for college a lot easier.

- Summer Scholars helped me to acquire better study habits. It helped me look at myself as a better person, making this a most enjoyable year.

- The biology course last summer was very helpful. It gave me a good foundation to start my advanced biology class this year. Also, going to surgery and ER helped because I learned about different ailments and diseases that were discussed later in biology and I could remember actually seeing people with those problems so it helped me understand better than just reading in a text book. Overall the program was great and it helped me affirm my career goals.

- The Summer Scholars program affected me somewhat in my decision to take the classes I did my senior year. Although I probably would have taken the same courses if I had not participated in Summer Scholars, I was able to enter these courses with a greater feeling of competitiveness, confidence, and belonging. This feeling came about by being surrounded by the other people involved with Summer Scholars. I was surrounded by a variety of intelligent, innovative people, whom I discovered were not that different from myself. I was able to learn and gain confidence at the same time. This came as a great help to me my Senior year. I hope that it will help me in the same way throughout the rest of my education.

Program Impact (Continued)

- The Summer Scholars program helped me get a good idea of what I wanted to do with my education. It helped me decide what type of courses I was going to have to take my senior year to prepare myself for my educational goals. It also helped me plan my college counseling and application process towards the best inside options for pre-medical/medical education.
- The Summer Scholars Program gave me a positive outlook on life and the goals I want to accomplish. By being a part of the program, I felt as if I had accomplished something major in my life. This strong sense of accomplishment carried over into my senior year, causing me to achieve anything I set my mind to. This of course, includes my senior classes. By reading down inside of myself and finding my inner drive, I have produced the best academic year I have ever had during my high school year. This drive that I am talking about is the same drive that forces me to be the best at whatever I do. Consequently I have done just that. I have received more awards for my academic abilities during my senior year in high school than the other previous years. I must also say that the Summer Scholars Program has strengthened my leadership abilities. Thus, I am pleased and honored to have been a part of this great program.
- My experience with the UMKC Summer Scholars Program gave insight and definition to my career goals and personal interests. The realistic exposure to medicine provided by the Program made me even more certain that the career I wanted to pursue after high school was medicine. It helped me to take the initiative to be a leader--I was elected National Honor Society Vice-President and Student Council Treasurer. My success in the program gave me courage to pursue a more rigorous schedule of classes. I'm currently enrolled in the UMKC Mathematics & Physics Institute taking Advanced Physics and Calculus 210. All in all UMKC Summer Scholars Program was a marvelous experience.
- The Summer Scholars Program helped me decide which classes I would need most. It also gave me a headstart in a class such as biology. I was able to give the other students in my class insights on many of the things we were learning. The Summer Scholars Program was an excellent program and I am very grateful that I was able to participate in it. Thank you.
- Participating in the Summer Scholars Program affected my senior year in a very positive manner. Although, I had already enrolled in my classes before participating in the program, I was able to fully commit myself to pursue a career in medicine. The program also enabled me to choose UMKC as my college choice. All in all, I feel that the Summer Scholars Program is a very worthwhile experience and should be continued because it adds a new, exciting dimension to the study of medicine.
- The program provided for a strong foundation on which to base the decision of which path the rest of my life would take. Even though my decision was not to go into a medical field I feel that I was still helped greatly by the program. It helped me develop my study habits, my aptitude test taking skills and note taking, all of which were beneficial in my senior year and years to come. Thank you for the opportunity.
- I've always considered myself to be a well-motivated individual academically but the knowledge that I brought with me to the Program only served as a basic foundation from which I was challenged by the instructors to increase and

Program Impact (Continued)

strengthen. The basic note taking, test taking and interviewing skills which were taught last summer I actively rely upon. It was through day-by-day exposure with the professionals that I came to retain a deeper understanding and respect of the many careers in medicine. It provided for a high school students so many features, laying a foundation upon which we can take the initiative and erect a successful career in medicine. The program motivated me to take many honors/accelerated courses which I was recommended for but to learn and retain this program helped me to see the realistic side of medicine. The Summer Scholars Program and those involved in presenting it are successful in their endeavors.

Summary

Questionnaire responses were received from eighteen of the eighteen graduating students who participated in the 1984 Summer Scholars Program (either regular or Advanced) at UMKC. Their responses indicated that: Fourteen of the students planned careers in the field of medicine and four had been accepted to the UMKC School of Medicine; all eighteen students returned to their high school and undertook strong academic programs that would help them prepare for admission to health education career programs; 43% of the students' coursework was in either science or mathematics; twelve students had scores of 24 or greater on the ACT; eighteen students sent 52 applications to 27 different colleges and universities and received 46 acceptances; respondents sent over fifty applications for financial aid to many varied funding sources and eleven students had received offers of \$2,000.00 or greater; ten of the students were in the top twenty-one of their graduating class; and, as illustrated by the open-ended responses, students cited a variety of ways in which the program helped motivate and prepare them for careers in the health science.

Taken together, these responses indicate that the program had considerable success in attracting students with high potential for careers in health sciences, particularly medicine, and in helping orient and prepare them for success in pursuing such careers after high school graduation.